REMARKS

In the Office Action of 5/3/2004, at page 8, the representation was made that claims 6, 11, 22-27, and 30-31 "would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims". The applicants complied with the requirement in the Amendment submitted 7/29/2004 by amending original claims 19 and 29 to conform to claims 22 and 30, respectively. These amendments were made in reliance on the representation of the USPTO that the claims would be allowed, and not because the applicants agreed in any way with the rejections in the Office Action of 5/3/2004. Surprisingly, in the Office Action dated 11/9/2004, the claims that were said to be "allowable if rewritten in independent form" were rejected over new art in spite of the representation. In failing to honor its representation and allow the claims, the USPTO has unfairly caused the applicants to suffer a hardship in the surrender of potential patent scope by the Amendment submitted 7/29/2004. Accordingly, the applicants request that the Office Action of 11/9/2004 be withdrawn and a Notice of Allowance be mailed forthwith.

In anticipation that the request above will be denied, the applicants submit the following remarks.

Claims 19, 23-26, 28 and 29 are rejected for obviousness over US Patent 6,018,406 ("Ishimatsu") in view of US Patent 5,400,369 ("Ikemura"). This rejection is traversed for the following reasons.

Rejection of a claim for obviousness over a combination of references requires that the examiner establish a *prima facie* case of obviousness constituted of three criteria: motivation to combine the references, a reasonable expectation of success, and the inclusion of all elements of the rejected claim in the combination. See MPEP 2143 et seq.

Ishimatsu discloses a non-regenerative optical repeater in an optical transmission system with wavelength division multiplexing. At col. 1, lines 10-12, Ishimatsu states that the invention concerns "optical repeater equipment to relay optical signals" on a transmission line "without regenerating electric signals from the optical signals". The problem addressed by this invention is the difficulty of

relating the wavelengths of optical signals with various optical transmission components and optical transmission characteristics in an optical transmission system. The solution is to collect supervisory information showing detected wavelengths of a wavelength-multiplexed optical transmission signal. See col. 2, line 60 through col. 3 line 12. The only information extracted from a transmitted signal at a repeater is an identification of each wavelength in the signal. In other words, the optical repeater monitors the wavelength of a transmitted signal, not the data that it contains. Ishimatsu omits any discussion or illustration of reading any information relating to content or structure of information contained by a transmitted wavelength signal.

Ikemura discloses a frame aligner with reduced byte and frame alignment circuitry for use with a high-speed serial data signal such as a SONET signal. The problem addressed by this invention is "the large size of the byte shifter" in a conventional frame aligner. See col. 1, lines 43-50. The solution is to search for a characteristic synch pattern in demultiplexed serial data by using a short shift register to detect the synch pattern. Ikemura does not disclose or illustrate the operational environment of the frame aligner, omitting any indication as to where it may be used in a transmission system.

No Suggestion to Combine

There is no suggestion to combine Ishimatsu with Ikemura, for two reasons. First, the references are directed to different, distinct technical problems whose solutions have nothing in common. Ishimatsu's problem is the lack of knowledge about the respective wavelengths in a wavelength-multiplexed optical signal. Ikemura, on the other hand seeks to constrain the size of circuitry used to detect frames in a serial demultiplexed data stream. Wavelength detection is concerned with determining the "color" of an optical signal. Nothing relevant to the colors of a multiplexed optical signal can be determined from the structure of frames of information carried by any of those colors. Conversely, knowledge respecting the colors of an optical signal conveys no knowledge of the frame structure of information carried on any wavelength of a multiplexed optical signal.

Second, Ishimatsu is directed to a non-regenerative repeater; that is, a repeater that amplifies multiplexed optical signals "without regenerating electric signals from the optical signals". See Ishimatsu at col. 1, lines 11, 12. In order to incorporate Ikemura's frame aligner into Ishimatsu's repeater, the optical signals would have to be optically demultiplexed in order to separate the wavelengths, and then electric signals would have to be regenerated from each wavelength. But Ishimatsu explicitly teaches away from such regeneration.

No Reasonable Expectation of Success

The examiner has presented no evidence that the proposed combination of Ishimatsu and Ikemura would be successful. In fact, the references suggest exactly the opposite. Ikemura's frame aligner requires the availability of information carried by a transmitted signal. Ishimatsu transmits information by way of wavelength-multiplexed optical signals through non-regenerative repeaters. The only way to obtain information at the level required for Ikemura's frame aligner to operate is to demultiplex the optical signals and demodulate each wavelength in order to regenerate the electrical signals which carry the information. But such regeneration would render Ishimatsu's non-regenerative repeater unfit for its purpose.

Omission of Claim Limitations

The proposed combination omits many elements and limitations that are explicitly recited in the claims. For example, taking claim 19 as exemplary, a "selectable frame synchronization structure transmission repeater" is necessarily a regenerative repeater. The teaching of Ishimatsu is explicitly limited to a non-regenerative repeater; Ikemura altogether fails to teach or suggest a repeater of any kind.

Further, claim 19 recites a "decoder" with an input port to receive a first stream of information including "a first arrangement of synchronization bits." Ishimatsu's repeater operates "without regenerating electric signals from the optical signals". The only way that a first stream of information with "a first arrangement of information bits" can be obtained in Ishimatsu's repeater is by "regenerating electric signals from the optical signals". However, Ishimatsu's

repeater is explicitly a non-regenerative device and therefore does not contain any port or decoder that accepts or receives "a first stream of information including a first arrangement of synchronization bits".

In an offer of proof that Ishimatsu includes a "decoder", the examiner states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate the functions of 100 and 200 per Fig 3 into a single unit in order to save space". See the Office Action of 11/09/2004 at page 2, 4th paragraph of section 3.0. This would seem contrary to Ishimatsu's specific teachings and also to general principles of transmission system design. Reference numeral 100 in Ishimatsu refers to optical terminal equipment. The function of the terminal equipment 100 is to "convert a subscriber signal into an optical signal and transmit it to the optical repeater equipment 200". See Ishimatsu at col. 4, lines 31-34. This is logical since the wavelength-multiplexed optical signal is at full strength at the terminal equipment, but attenuates with the distance it travels from the terminal equipment through the optical fibers. At some point, the attenuated optical signal must be amplified in order to permit it to be transmitted over a greater distance. A repeater provides such amplification. There is no conceivable technical reason to place a repeater in terminal equipment. Nor is there any reason to place terminal equipment in a repeater, at least in Ishimatsu's arrangement. The incorporation of terminal equipment 100 into a repeater 200 would increase the size of the repeater and would evidently convert it into a regenerative device. Neither result is suggested in Ishimatsu. Accordingly, the examiner is requested to either take Official Notice, or cite a reference in support of the proposition that "it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate the functions of 100 and 200". Otherwise, the statement should be retracted.

Similar considerations apply to claim 29 and to the remaining claims, which depend from claim 19 or claim 29.

Claims 19 and 23-28 are rejected for vagueness. This rejection is traversed for the following reasons.

With respect to claim 19, the examiner contends that the recitation "selecting a number of synchronization bits in the range from zero to *m* bits" is unclear. Specifically, the examiner questions how one can select zero bits, whether the whole header can be selected, and whether the value of *m* can be less than the maximum header size. As pointed out by the applicants at page 2, lines 14-18: it would be advantageous if an overhead word used to synchronize frames in digital communications could be made selectable. Particularly, it would be useful "if the content of the word, the number of bits in the word, and the arrangement of bits in the header section were selectable by the user". Manifestly, in view of the specification, the wording of the recitation in claim 19 describes a decoder with an input for selecting a number of synchronization bits where the number - that is to say, the count – of synchronization bits selected is in a range that extends from 0 to *m*, where *m*, as the examiner has realized, is the maximum number of bits that a header section can have. Thus, for example, the input can select 1 bit (less than the header size if *m*=8), three bits (the entire header, if *m*=3), *m* bits (the entire header), or no bits (0). These possibilities are well within a reasonable reading of "selecting a number of synchronization bits in the range from zero to *m* bits". Therefore, the language of claim 19 has at least a reasonable degree of particularity. See MPEP 2173.02.

As to claim 23, the examiner asks: "How can deinterleaving be performed when interleaving has not already been performed?" One answer is that at least some part of the first stream of information is interleaved (or multiplexed). Reference in this regard is given to the specification at page 11, lines 10-12 where the use of interleaving in standard FEC applications is discussed. Interleaved data structures are also discussed at many other locations throughout the specification. Dealing with a "stream of information" that is interleaved (or multiplexed) as understood with reference to the specification would reasonably involve a deinterleaver. Therefore, the language of claim 23 has at least a reasonable degree of particularity. See MPEP 2173.02.

Of course, the applicants would give careful attention to any claim language suggested by the examiner to further improve clarity or precision of the language of claims 19 and 23. See MPEP 2173.02.

In view of these remarks, it is submitted that the claims clearly and precisely define subject matter that is patentable over the references of record.

Respectfully submitted,

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